IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS

Appellants:	Geile et al.	**APPEAL BRIEF**
Serial No.	09/903,273	
Filing Date	July 11, 2001	
Group Art Unit	2683	
Examiner	William D. Cumming	
Attorney Docket No.	100.070US27	
Title: DYNAMIC BANDWIDTH ALLOCATION		

Table of Contents

APPEAL BRIEF UNDER 37 C.F.R. §41.37

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

The Appeal Brief is presented in support of the Notice of Appeal to the Board of Patent Appeals and Interferences, filed on March 23, 2005, from the Final Rejection of claims 2-5 and 19-36 set forth in the Final Office Action mailed on September 27, 2004. Three copies of this Appeal Brief are hereby timely filed on June 27, 2005 and are accompanied by a fee in the amount of $500.00 as required under 37 C.F.R. § 41.20(b)(2). The Appellants respectfully request consideration and reversal of the Examiner's rejections of pending claims.

This paper is also accompanied by a Petition, as well as the appropriate fee, to obtain a one-month extension of the period for filing the Appeal Brief, thereby moving the deadline for filing the brief from May 25, 2005 to June 25, 2005.

1. Real Party in Interest

The real party in interest in the above-captioned application is the assignee ADC Telecommunications, Inc.

2. Related Appeals and Interferences

There are no other appeals or interferences known to Appellants that will have a bearing on the Board's decision in the present appeal.

3. Status of the Claims

Claims 2-5 and 19-36 are pending in the application and are the subject of this appeal. In an office action mailed September 27, 2004, claims 2-5 and 19-36 were rejected under 35 U.S.C. §103.

4. Status of Amendments

No amendment has been filed subsequent to the Final Office Action mailed September 27, 2004.

5. Summary of Claimed Subject Matter

Pursuant to 37 C.F.R. §41.37(c)(1)(v), Applicant provides the following concise explanation of the subject matter defined in each independent claim with reference to the specification by page and line number and to the drawings by reference number. Applicant submits that the citations to the specification and drawings are not intended to be exhaustive and that other support for the various claims may also be found throughout the specification and drawings.

A. Claim 2

Claim 2 is directed to a telecommunications system with a multi-carrier transmission scheme that dynamically allocates bandwidth among a plurality of service units. The system of claim 2 is described in the specification at p. 32, lines 11-28; p. 34, line 15 –p. 36, line 5; p. 40, lines 12 – 25; p. 42, line 16 – p. 43, line 17; p. 66, lines 4 – 23; and p. 192, line 21 – p. 197, line13 and Figures 1, 3, 8, and 59-67. The system includes a head end that transmits data over a transmission medium to the service units (100, 61, 68), the head end (32) comprising a modem circuit (82) for narrow band transmission in at least one transmission channel, each transmission channel including a number of subbands having a number of payload channels and a control channel in each subband Figures 63-67). The system further includes a control circuit(900) in the head end that assigns each service unit to a subband for transmission and receipt of data and the control circuit is further operable to allocate a payload channel to a service unit in response to a request for a service unit.

B. Claim 19

Claim 19 is directed to a method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with

transmission channels that include a number of subbands, each subband including a number of payload channels. The method of claim 19 is described in the specification at p. 194, line 26 to p. 197, line 21, and p. 32, line 9 – p. 33, line 1 and in Figures 1, 3, 8, and 59-67. The method includes selectively assigning service units to the subbands such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands of the system and selectively allocating payload channels within a subband to service units assigned to the subband.

C. Claim 30

Claim 30 is directed to a method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands, each subband including a number of payload channels and at least one control channel. The system of claim 30 is described in the specification at page 194, line 26 to p. 197, line 21 and in Figures 1, 3, 8, and 59-67. The method includes selectively assigning a first service unit to a subband located substantially at a center of the bandwidth and selectively assigning additional service units to the subbands such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands of the system.

D. Claim 33

Claim 33 is directed to a method a telecommunications system. The system of claim 33 is described in the specification at page p. 32, line 9 - p. 36, line 5; p. 40, line 12 – p. 43, line 17; p. 66, lines 4 – 23, p. 192, line21 – p. 197, line 13 and in Figures 1, 3, 8, and 59-67. The system a head end that transmits data over a transmission medium to a number of service units, the head end comprising a modem circuit for transmission in at least one of a number of subbands of a transmission bandwidth, each subband having a number of payload channels and a control channel, a control circuit in the head end that assigns each service unit to a subband such that the service units are substantially evenly distributed over the subbands and the control circuit is further operable to allocate a payload channel to a service unit in response to a request for bandwidth for a service unit.

E. Claim 34

Claim 34 is directed to a method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands, each subband including a number of payload channels. The system of claim 34 is described in the specification at p. 194, line 26 to p. 197, line 21 and p. 132, line 9 – 133, line 1 and in Figures 1, 3, 8, and 59-67. The method includes selectively assigning a first service unit to a subband located substantially at a center of the bandwidth and selectively assigning additional service units to the subbands such that the load of the service units of the telecommunications system is substantially evenly distributed over the number of subbands of the system.

F. Claim 35

Claim 35 is directed to a method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with a number of subbands, each subband including a number of payload channels. The system of claim 35 is described in the specification at p. 132, line 9 – 133, line 1; p. 193, line 21 – p. 197, line 21 and in Figures 1, 3, 8, and 59-67. The method includes determining at least one characteristic of a service unit and selectively assigning the service unit to a subband based on the at least one characteristic such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands of the system.

6. Grounds of Rejection to be Reviewed on Appeal

Whether the Examiner erred in rejecting claims 2-5 and 19-36 under 35 U.S.C. §103(a) as being unpatentable over Bingham et al., (U.S. Patent No. 5,644,573) in view of Clark et al. (U.S. Patent No. 3,742,145).

7. Arguments

A. Rejection of claims 2-5 and 19-36 under 35 U.S.C. §103(a)

i. The Applicable Law

35 U.S.C.§ 103 provides in relevant part:

Conditions for patentability; non-obvious subject matter.

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

"The ultimate determination...whether an invention is or is not obvious is a legal conclusion based on underlying factual inquiries including (1) the scope and content of the prior art; (2) the level of ordinary skill in the prior art; (3) the differences between the claimed invention and the prior art; and (4) the objective evidence of nonobviousness." In re Dembiczak, 175 F.3d 994, 998, 50 USPQ2d 1614, 1616 (1999) (citing Graham v. John Deere Co., 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966)).

When applying 35 U.S.C. §103, the claimed invention must be considered as a whole; the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention and a reasonable expectation of success is the standard with which obviousness is determined. Hodosh v. Block Drug Co., Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

To establish a case of *prima facie* obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally,

the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based in the applicant's disclosure. *In re vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir 1991). MPEP § 2143 - § 2143.03.

ii. Rejection of claims 2-5 and 19-36 under 35 U.S.C. § 103(a)

The Examiner rejected claims 2-5 and 19-36 as being unpatentable over Bingham et al., (U.S. Patent No. 5,644,573) in view of Clark et al. (U.S. Patent No. 3,742,145). Applicant respectfully traverses the rejection.

Claim 2 is directed to a telecommunications system with a multi-carrier transmission scheme that dynamically allocates bandwidth among a plurality of service units. The system includes a head end that transmits data over a transmission medium to the service units, the head end comprising a modem circuit for narrow band transmission in at least one transmission channel, each transmission channel including a number of subbands having a number of payload channels and a control channel in each subband, a control circuit in the head end that assigns each service unit to a subband for transmission and receipt of data and the control circuit is further operable to allocate a payload channel to a service unit in response to a request for a service unit.

Bingham et al. do not teach or suggest the telecommunications system of claim 2. In particular, Bingham et al. do not teach or suggest each transmission channel including a number of subbands having a number of payload channels and a control channel in each subband. There is no discussion of a control channel in each subband as found in claim 2. In contrast, Bingham et al. discuss discrete sub-channels versus a number of subbands having a number of payload channels and a control channel as found in claim 2. As a result, Bingham et al. do not anticipate the system of claim 2. Further, the Examiner correctly indicates that Bingham et al. do not disclose "subbands having a number of payload channels and a control channel in each subband." The Examiner asserts that Clark et al. is evidence that subbands having a number of payload

channels and a control channel in each subband is about 32 year old subject matter and well known in the art. The Examiner takes Official notice as such and asserts that the evidence shows that the Applicants did not invent subbands having a number of payload channels and a control channel in each subband. As indicated above Applicant respectfully traverses this rejection. Clark et al. do not overcome the deficiencies of Bingham et al. and neither Bingham et al. nor Clark et al. alone or in combination teach or suggest the telecommunications system of claim 2.

The Examiner has provided no basis for his assertion that Clarke et al. teaches or suggests each transmission channel including a number of subbands having a number of payload channels and a control channel in each subband as found in claim 2. Further, the Examiner provides no motivation either in the references or in art to combine the variety of methods of coordinating communications between a plurality of remote units and a central unit to facilitate communications using a frame based discrete multi-tone (DMT) transmission scheme as discussed in Bingham et al. with the asynchronous time division multiplexer and demultiplexer that operates on the basis of a stuff only technique of Clark et al. (See respective Abstracts). Further, Applicant finds no reasonable expectation of success in combining these references. Applicant does not find that Clark et al. teaches or suggests each transmission channel including a number of subbands having a number of payload channels and a control channel in each subband as found in claim 2. In contrast, Clark et al. discusses an asynchronous time division multiplexer and demultiplexer and timing signals generated from a reference oscillator that define the synchronous data format from which includes 64 midframes within a superframe with each of the midframes including 15 subframes. Odd numbered ones of the subframes include 9 data bits and even numbered ones of the subframes include 8 data bits. The 9th data bit of the odd numbered subframes provide an overhead channel from transmitting digital voice orderwire, digital data order wire, control words, a "zero" short synch bit, a "one" short synch bit and a long sync git in each midframe. (See Abstract) There is no discussion of what each transmission channel includes or that each transmission channel includes a number of subbands having a number of payload channels and a control channel in each subband as the Examiner suggests. Applicant asserts that even if the two references could be combined that they do not teach or

suggest the system of claim 2. Withdrawal of the rejection of claim 2 is respectfully requested.

Claims 3-5 depend from claim 2 and thus are allowable over the art at least for the reasons identified above. Reversal of the rejection is respectfully requested.

Claim 19 is directed to a method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands, each subband including a number of payload channels. The method includes selectively assigning service units to the subbands such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands of the system and selectively allocating payload channels within a subband to service units assigned to the subband.

As discussed above with respect to claim 2, Bingham et al. do not teach or suggest subbands but in contrast discuss discrete sub-channels and as a result do not include a number of subbands, each subband including a number of payload channels nor selectively assigning service units to the subbands such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands and selectively allocating payload channels within a subband to service units assigned to the subband as found in claim 19. Further, the Examiner provides no motivation either in the references or in art to combine the variety of methods of coordinating communications between a plurality of remote units and a central unit to facilitate communications using a frame based discrete multi-tone (DMT) transmission scheme as discussed in Bingham et al. with the asynchronous time division multiplexer and demultiplexer that operates on the basis of a stuff only technique of Clark et al. (See respective Abstracts). Further, Applicant finds no reasonable expectation of success in combining these references.

Applicant does not find that Clark et al. teaches or suggests a method of allocating bandwidth in a system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands having a number of payload channels nor selectively assigning service units to the subbands such that the service units of the telecommunications

system are substantially evenly distributed over the number of subbands of the system as found in claim 19. In contrast, Clark et al. discusses an asynchronous time division multiplexer and demultiplexer and timing signals generated from a reference oscillator that define the synchronous data format from which includes 64 midframes within a superframe with each of the midframes including 15 subframes. Odd numbered ones of the subframes include 9 data bits and even numbered ones of the subframes include 8 data bits. The 9th data bit of the odd numbered subframes provide an overhead channel from transmitting digital voice orderwire, digital data order wire, control words, a "zero" short synch bit, a "one" short synch bit and a long sync git in each midframe. (See Abstract) There is no discussion of what each transmission channel includes or that each transmission channel includes a number of subbands having a number of payload channels and the system selectively assigning service units to the subbands such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands as found in claim 19.

As a result claim 19 is not anticipated by Bingham et al. in view of Clark et al. and should be allowed. Withdrawal of the rejection of claim 19 is respectfully requested.

Claims 20-29 depend from claim 19 and thus are allowable over the art at least for the reasons identified above. Reversal of the rejection is respectfully requested.

Claim 30 is directed to a method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands, each subband including a number of payload channels and at least one control channel. The method includes selectively assigning a first service unit to a subband located substantially at a center of the bandwidth and selectively assigning additional service units to the subbands such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands of the system.

With respect to claim 30, Applicant refers the Board to the arguments presented above with respect to claims 2 and 19 and asserts that claim 30 is similarly not anticipated by Bingham et al. in view of Clark et al. Further Applicant does not find that Bingham et al. nor Clark et al.

alone or in combination teach or suggest selectively assigning a first service unit to a subband located substantially at a center of the bandwidth and selectively assigning additional service units to the subbands such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands as found in claim 30. As a result claim 30 is also allowable. Withdrawal of the rejection of claim 30 is respectfully requested.

Claims 31 and 32 depend from claim 30 and thus are allowable over the art at least for the reasons identified above. Reversal of the rejection is respectfully requested.

Claim 33 is directed to a telecommunications system. The system includes a head end that transmits data over a transmission medium to a number of service units, the head end comprising a modem circuit for transmission in at least one of a number of subbands of a transmission bandwidth, each subband having a number of payload channels and a control channel, a control circuit in the head end that assigns each service unit to a subband such that the service units are substantially evenly distributed over the subbands and the control circuit is further operable to allocate a payload channel to a service unit in response to a request for bandwidth for a service unit.

With respect to claim 33, Applicant respectfully refers the Board to the arguments presented above with respect to claims 2, 19 and 30 and asserts that claim 33 is similarly not anticipated by Bingham et al. in view of Clark et al. Withdrawal of the rejection of claim 33 is respectfully requested.

Claim 34 is directed to a method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands, each subband including a number of payload channels. The method includes selectively assigning a first service unit to a subband located substantially at a center of the bandwidth and selectively assigning additional service units to the subbands such that the load of the service units of the telecommunications system is substantially evenly distributed over the number of subbands of the system.

With respect to claim 34, Applicant respectfully refers the Examiner to the arguments presented above with respect to claims 2, 19, 30 and 33 asserts that claim 34 is similarly not anticipated by Bingham et al. in view of Clark et al. Withdrawal of the rejection of claim 34 is respectfully requested.

Claim 35 is directed to a method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with a number of subbands, each subband including a number of payload channels. The method includes determining at least one characteristic of a service unit and selectively assigning the service unit to a subband based on the at least one characteristic such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands of the system.

With respect to claim 35, Applicant respectfully refers the Examiner to the arguments presented above with respect to claims 2, 19, 30 and 33-35 and asserts that claim 36 is similarly not anticipated by Bingham et al. in view of Clark et al. Withdrawal of the rejection of claim 35 is respectfully requested.

Claim 36 depends from and further defines allowable claim 35 and for at least the reasons provided above claim 36 should also be allowed.

iii. Seasonable Challenge

The Examiner asserts that the Applicants failed to seasonably challenge the Official notice stated in the Office action dated May 21, 2003. An Amendment and Response to the Office Action dated May 21, 2003 was filed on October 21, 2003 and Applicant traversed the rejection of claims 4, 26, 27 and 28 under 35 U.S.C. §103(a) as being unpatentable over Timm et al. On page 22 of the amendment and response filed October 21, 2003, Applicant traversed the rejection and provided arguments that the rejection was not proper because the cited art (Timm et al.) was not proper prior art as Timm et al. and it's parent application were both filed after the priority date of the present application. Timm et al. was filed on June 20, 1996 and is a continuation in part of application No. 08/645,020 filed on May 9, 1996. The present application

has an effective filing date of February 6, 1995. In addition, the Applicants stated "[F]urther, in responding to the rejections, Applicant does not admit that the references are prior art and does not acquiesce to any of the rejections or statements presented by the Examiner."

Applicants contend that the rejections under 35 U.S.C. §103(a) were timely traversed and the challenging of the taking of official notice regarding hybrid fiber-coax telecommunications systems and deriving bit error rates was seasonable. A seasonable challenge constitutes a demand for evidence made as soon as practicable during prosecution. (MPEP 2144.03) Subsequently in an Amendment and Response filed on June 8, 2004 the Applicant again traversed rejections asserted by the Examiner and stated "Applicant requests that the Examiner make specific note that the Applicant traverses all rejections presented in the Office Action of January 09, 2004 and further with respect to the rejections under 35 USC §103(a) does not find that it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to incorporate the well known use of hybrid fiber-coax telecommunication systems and bit error rates in the telecommunication system of Bingham et al. in order to increase the overall bandwidth of the telecommunication system by adding fiber cables and to correct errors during transmission of digital data as asserted by the Examiner."

Applicant further contends that it has shown claims 4, 26, 27 and 28 to be patentably distinct from the current rejection under 35 USC §103(a) as being unpatentable over Bingham et al. in view of Clark et al. The taking of official notice regarding hybrid fiber-coax telecommunications systems and deriving bit error rates does not overcome the deficiencies of the cited references as they are applied to claims 4, 26, 27 and 28..

Reversal of the rejections under 35 U.S.C. §103(a) is respectfully requested.

8. Summary

Appellants have set forth reasons why the Examiner is incorrect in maintaining the rejections of the pending claims. Specifically, the Examiner has failed to set forth a prima facie case of obviousness. Bingham et al. and Clark et al. either alone or in combination do not teach all of the limitations in the pending independent and dependant claims. Appellant respectfully

submits that, for the above reasons, Claims 2-5 and 19-36 are allowable over the cited art. Therefore, reversal of the Examiner's rejections is respectfully requested.

Respectfully submitted,

Date: 27 June 2005

Laura A. Ryan
Reg. No. 49,055

Attorneys for Applicant
Fogg and Associates, LLC
P.O. Box 581339
Minneapolis, MN 55458-1339
T 612 332-4720
F 612 332-4731

Appendix 1

The Claims on Appeal

2. (Previously Presented) A telecommunications system with a multi-carrier transmission scheme that dynamically allocates bandwidth among a plurality of service units, the system comprising:

a head end that transmits data over a transmission medium to the service units, the head end comprising a modem circuit for narrow band transmission in at least one transmission channel, each transmission channel including a number of subbands having a number of payload channels and a control channel in each subband;

a control circuit in the head end that assigns each service unit to a subband for transmission and receipt of data; and

the control circuit is further operable to allocate a payload channel to a service unit in response to a request for a service unit.

3. (Previously Presented) The system of claim 2, wherein the control circuit is operable assign a number of service units to each subband for selective use of the payload channels in the subband by the service units so as to increase the number of service units that can be coupled to the system.

4. (Previously Presented) The system of claim 2, wherein the transmission medium comprises a hybrid fiber-coax telecommunications system.

5. (Previously Presented) The system of claim 2, wherein the head end comprises at least one modem circuit for each transmission channel.

19. (Previously Presented) A method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a

number of subbands, each subband including a number of payload channels, the method comprising:

selectively assigning service units to the subbands such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands of the system; and

selectively allocating payload channels within a subband to service units assigned to the subband.

20. (Previously Presented) The method of claim 19, wherein selectively assigning service units comprises assigning the service units based on at least one of a type of the service unit, a likely load on a control channel for the service unit, a number of available payload channels in a subband, and historical data on transmission quality over the payload channels of the subband.

21. (Previously Presented) The method of claim 19, wherein selectively assigning service units comprises assigning subbands to service units beginning with subbands substantially at the middle of the available bandwidth.

22. (Previously Presented) The method of claim 19, wherein selectively assigning service units comprises assigning one or more service units to a selected subband.

23. (Previously Presented) The method of claim 19, wherein selectively assigning service units comprises assigning at least two service units of different types to a selected subband.

24. (Previously Presented) The method of claim 19, wherein selectively allocating channels within a subband comprises:

allocating a first payload channel to a service unit in a subband of a transmission channel of the telecommunications system;

monitoring the quality of the first payload channel; and

when the quality of the first payload channel drops below a threshold, allocating a second, different payload channel to the channel unit.

25. (Previously Presented) The method of claim 24, and further comprising the step of deallocating the first payload channel after communication over the second payload channel is established.

26. (Previously Presented) The method of claim 24, wherein the step of monitoring the quality of the first payload channel comprises the step of deriving a probable bit error rate for the first payload channel.

27. (Previously Presented) The method of claim 26, wherein the step of deriving a probable bit error rate comprises the step of sampling the a parity bit of each n-bit word of the payload channel.

28. (Previously Presented) The method of claim 24, wherein the step of allocating a second, different payload channel comprises the step of allocating a second payload channel in the same subband as the first payload channel.

29. (Previously Presented) The method of claim 19, and further comprising selectively reassigning a service unit to another subband when sufficient channels are not available to handle a request from the service unit.

30. (Previously Presented) A method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands, each subband including a number of payload channels and at least one control channel, the method comprising:

selectively assigning a first service unit to a subband located substantially at a center of the bandwidth; and

selectively assigning additional service units to the subbands such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands of the system.

31. (Previously Presented) The method of claim 30, and further including:

selectively allocating channels within a subband to service units assigned to the subband.

32. (Previously Presented) The method of claim 30, wherein selectively assigning a first service unit and selectively assigning additional service units comprises assigning the service units based on at least one of a type of the service unit, a likely load on a control channel for the service unit, a number of available payload channels in a subband, and historical data on transmission quality over the payload channels of the subband.

33. (Previously Presented) A telecommunications system comprising:

a head end that transmits data over a transmission medium to a number of service units, the head end comprising a modem circuit for transmission in at least one of a number of subbands of a transmission bandwidth, each subband having a number of payload channels and a control channel;

a control circuit in the head end that assigns each service unit to a subband such that the service units are substantially evenly distributed over the subbands; and

the control circuit is further operable to allocate a payload channel to a service unit in response to a request for bandwidth for a service unit.

34. (Previously Presented) A method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with transmission channels that include a number of subbands, each subband including a number of payload channels, the method

comprising:

selectively assigning a first service unit to a subband located substantially at a center of the bandwidth; and

selectively assigning additional service units to the subbands such that the load of the service units of the telecommunications system is substantially evenly distributed over the number of subbands of the system.

35. (Previously Presented) A method for allocating bandwidth in a telecommunications system that uses a multi-carrier transmission scheme with a number of subbands, each subband including a number of payload channels, the method comprising:

determining at least one characteristic of a service unit; and

selectively assigning the service unit to a subband based on the at least one characteristic such that the service units of the telecommunications system are substantially evenly distributed over the number of subbands of the system.

36. (Previously Presented) The method of claim 35, wherein determining at least one characteristic of a service unit comprises determining at least one of a type of the service unit, a likely load on a control channel for the service unit, and a likely load of the service unit.